IN THE CLAIMS

1-6. (canceled)

7. (original) A renal replacement therapy system, comprising: a filter, an arterial blood line connectable to a patient access and adapted to convey blood from said patient access to a filter; a venous blood line connectable to said patient access and adapted to convey blood from said filter to patient access; and a pump configured to convey blood through said arterial blood line, a sensor to sense pressure in said arterial blood line, and a controller connected to receive a pressure signal from said sensor and to control a rate of flow of said pump; said controller being configured to maintain a constant pressure in said arterial blood line by regulating a speed of said pump in response to said pressure signal.

8. (original) A system as in claim 7, wherein said controller is configured to slow said rate of flow when said pressure drops.

9. (original) A system as in claim 8, wherein said controller is configured to speed up said rate of flow when said pressure increases.

10. (canceled).

11. (original) A system as in claim 7, wherein said controller is a microcomputer programmed to compare said pressure signal with a predetermined value.

12. (currently amended) A system as in claim 7, wherein said controller is configured such that when resistance to flow in the arterial blood line increases ~~said patient access becomes clogged~~, said rate of flow is slowed.

13. (new) A renal replacement therapy system, comprising: a filter, an arterial blood line connectable to a patient access and adapted to convey blood from said patient access to a filter; a venous blood line connectable to said patient access and adapted to convey blood from said filter to patient access; and a pump configured to convey blood through said arterial blood line, a sensor to sense pressure in said arterial blood line, and a controller connected to receive a pressure signal from said sensor and to control a non-zero rate of flow of said pump between

multiple different flow rates such that a constant pressure is maintained, during pumping, in said arterial blood line by regulating a speed of said pump in response to said pressure signal.

14. (new) A system as in claim 13, wherein said controller is configured to slow said rate of flow when said pressure drops.

15. (new) A system as in claim 14, wherein said controller is configured to speed up said rate of flow when said pressure increases.

16. (new) A system as in claim 13, wherein said controller is a microcomputer programmed to compare said pressure signal with a predetermined value.

18. (new) A system as in claim 13, wherein said controller is configured such that, when resistance to flow in the arterial blood line increases, said rate of flow is slowed.